

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

ORDER NO. 95-209

UPDATED WASTE DISCHARGE REQUIREMENTS FOR:

UNOCAL CORPORATION  
RODEO, CONTRA COSTA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board) finds that:

1. Unocal Corporation, Refining and Marketing Division, San Francisco Refinery, referred to herein as the discharger, owns and operates a petroleum refinery located at Rodeo, Contra Costa County as shown on Figure 1. The refinery produces fuels and lubricants and is classified as a lube refinery as defined by the U. S. Environmental Protection Agency in 40 CFR 419.40. Daily crude throughput consists of approximately 90,000 barrels of oil. The refinery began operations at this location in 1896. Wastes generated from the refining and manufacturing processes have been disposed of at various locations at the refinery site over the course of the years.

PURPOSE OF UPDATING ORDER:

2. The primary purpose of this Order is to update the site's groundwater monitoring program and implement the perimeter groundwater control systems.

SITE DESCRIPTION:

3. The site is in a flat floored valley lying between Crocket and Rodeo adjacent to San Pablo Bay. The valley drains an area of approximately 1,100 acres, all part of the refinery property. The valley is a syncline with an east/west axis dipping to the west towards San Pablo Bay. The formations of the northern limb dip almost vertically and the formations of the southern limb dip at an approximate angle of 35°. More than 95% of the area drainage flows towards San Pablo Bay. Some small amount of drainage flows northward into Canyon Del Cierbo, towards the north. The site is bisected by Highway I-80 with approximately 40% located west of the highway, the area hosting the refinery and the majority of storage tanks. The area east of I-80 is mostly unutilized, except some portions which were utilized for waste disposal and hosts the seasonal products storage tanks.

## SITE HISTORY:

4. On December 13, 1989 the Board adopted Waste Discharge Order 89-180 ordering the discharger to further investigate the onsite waste management units, undertake plume tracking at the Land Treatment Area, investigate potential leakage from the Primary, Main Storm and the Effluent Safety Basin, detail the geology of the site, increase perimeter monitoring and determine the extent of floating hydrocarbon pools found in the western part of the refinery, in close proximity to the San Pablo Bay shoreline. The Board adopted Site Cleanup Order No. 93-046 on May 19, 1993 requiring the discharger to prepare a corrective studies work plan to prevent migration of polluted groundwater into San Pablo Bay, perform additional groundwater monitoring at the Seasonal Products Tank Farm, develop a recovery system for floating hydrocarbons, make an assessment of the acceptability of existing monitoring wells and install several additional wells.

## GEOLOGIC SETTING OF THE SITE

5. In descending stratigraphic order, the lithologic units of the bay sediments that are represented along the Bay front are fill, bay mud, bay sand and old bay mud. The hydrogeologic units of the bay sand and bay mud are significantly different and an understanding of their distribution is critical in performing a groundwater quality monitoring program. The distribution of these major lithologic units deviates from this sequence in some areas where the bay mud or bay sand are absent. There also is considerable spatial variation of the thickness of these units. These upper unconsolidated units overly the nearly flat lying Montezuma Formation composed of a series of estuarine and continental deposits which overlies the downward warped consolidated Miocene San Pablo Group of sediments forming a syncline. Geotechnical borings identified two major buried valleys beneath the bay front sediments. These two valleys are bayward extensions of the buried drainages which follow the synclinal axis of the San Pablo Group and lie beneath the Primary and Main Storm Basins and extend underneath the Effluent Safety basin.
6. Coarse bay sand was deposited in the area of present day San Pablo Avenue which formed an elevated beach ridge. Further from the shoreline in deeper water the beach sand graded into finer grained sand. The bay front, previous to construction of the Southern Pacific Railroad, was an embayment created by the presently buried stream discharges which was cut-off from the Bay by the railroad embankment. Unocal disposed of various wastes and placed fill in this depression to bring it up to grade. The elevated bay sand is not overlain by bay mud, whereas the finer grained sand was deposited in deeper water and is covered by bay mud.

7. Groundwater south of the P G & E saltwater outfall occurs from 6 to 10 feet above mean sea level along most areas of the bay front, with the gradient towards San Pablo Bay. There are two water-bearing zones near the bay front, the A zone which hosts the water table and the deeper bay sand and the B zone. The A zone occurs in bay mud deposits which are overlain by fill or occurs in the fill itself. The lower water bearing zone (B zone) occurs below the bay mud in shallow surface drainages of the San Pablo Formation which hosts fine to very fine grained bay sand deposits varying in thickness from 4 to 8 feet. This fine grained sand extends towards the bay front and underlies a short section of the extraction trench. The A zone is located in bay sand or fill, in areas where the bay mud is absent, and in bay mud and fill areas where bay mud is present. In most areas of the bay front the groundwater table is within the low permeability bay mud and fill and flow of contaminants in the groundwater table is slow. The fine grained deeper bay sand of the B zone has low permeability and contaminant flow is very slow. The B zone becomes finer and less hydraulically conductive near the bay front.
8. The main groundwater basin on site underlies the San Francisco Refinery area. The basin occupies the area underlain by the axis of the syncline and groundwater gradient has a general north-west direction. The basin drains into San Pablo Bay. A smaller groundwater basin on site is the Tormey groundwater basin which is present in the northeast of the site along the Tormey Hill ridge with groundwater gradient producing migration into Canyon de Cierbo. This basin underlies a small portion of the upper tank farm. (Figure 2)
9. Studies were undertaken to determine if perimeter groundwater quality control should be part of the corrective action strategy at the Unocal Refinery. The presence of the refinery, pipelines, storage tanks and other equipment ancillary to refining operations makes access to these areas for installation of monitoring wells and groundwater monitoring infeasible. Water quality data from this area is best obtained from peripheral monitoring wells.
10. The discharger installed a 2,500 foot long extraction trench along the property boundary near the present day bay shore. The extraction trench is designed to capture contaminated ground water and floating hydrocarbons migrating within the A zone into San Pablo Bay. The trench is tied into topographically elevated basement rocks at each end to prevent groundwater from flowing around the trench terminals.
11. The objectives of the groundwater quality program are:
  - 1) Monitoring of off-site contaminant migration pathways located near the perimeter of the refinery.

- 2) Monitoring of the interior areas of the refinery (e.g., above ground storage tanks with a history of bottom repair) where hydrocarbons may be present in recoverable quantities,(i.e., source areas).
- 3) Monitoring at site interior Waste Management Units (WMUs) pursuant to Chapter 15.
- 4) Monitoring of contaminant source areas in the interior of the refinery..

## RESULTS OF INVESTIGATIONS

### 12. Active waste management units

- a. Groundwater chemistry results of subsurface investigations were conducted at the Primary and Main Storm Basins and at the Effluent Safety Basin. The Primary Storm Basin has a capacity of 2.3 million gallons and receives a mixture of process wastewater and stormwater runoff when the storage capacity of the wastewater treatment plant and storm water aboveground tanks is exceeded. The basin is concrete lined. The Main Storm Basin has a capacity of 7.2 million gallons and receives stormwater runoff only when the capacity of the tankage at the wastewater treatment plant and the Primary Storm Basin are exceeded; The effluent Safety Basin has a capacity of 1.3 million gallons and receives once-through saltwater cooling water. The basin has earthen sides and an earthen bottom.
- b. Groundwater quality in the vicinity of the Primary Storm Basin collected from monitoring wells contained Total Petroleum Hydrocarbons (TPH) in groundwater in three wells, two wells contained arsenic and one well contained barium.
- c. Monitoring wells in the vicinity of the Main Storm Basin showed groundwater in three monitoring wells with a maximum concentration of 2.9 mg/l TPH and arsenic in two wells with a maximum concentration limit of 0.02 mg/l and barium in two wells with a maximum concentration of 0.64 mg/l.
- d. Groundwater monitoring wells in the vicinity of the Effluent Safety Basin showed TPH to be present in five out of eleven monitoring wells with a maximum TPH concentration of 3.0 mg/l, and dissolved arsenic in one well with a concentration of 0.069 mg/l and dissolved barium at a maximum concentration of 5.1 mg/l from several wells. A number of the monitoring wells in these areas have floating hydrocarbons in the well bore, precluding sampling of groundwater.

13. Inactive waste management units (Figure 3)

- a. The Land Treatment Area was used to dispose of biologically degradable refinery waste. Groundwater quality in the vicinity of the unit does not appear to be affected downgradient or beneath the unit.
- b. Inactive waste sites 2 and 3 are located in the upper tank farm which is traversed by the Groundwater Basin Divide separating the Refinery Groundwater Basin from the Tormey Hill Groundwater Basin. Both sites are located in the Tormey Hill groundwater basin. The Tormey Hill site is underlain by bedrock. These sites were cleaned up under the direction of the Department of Health Services. No contamination was found to migrate into Canyon del Cierbo.
- c. Inactive waste site 4 is located in the central portion of the refinery where leaded tank bottom sludges were disposed. TPH was not detected in the downgradient wells from the site. Barium, cobalt, vanadium, zinc and molybdenum were present in groundwater downgradient of Site 4 at concentrations slightly above the detection limit and below Maximum Contaminant Levels (MCLs) and generally below or comparable to concentrations measured upgradient of the site.
- d. Inactive waste sites 5 and 8 are located adjacent to each other in close proximity to the San Pablo Bay shoreline. Site 5 was used for the disposal of leaded gasoline tank bottom sludges (LGTBS). Site 8 served for the disposal of acid sludge. Waste constituents are primarily petroleum hydrocarbons, metals, semivolatile and volatile organic and acidic residues. Investigations showed that metals were migrating downgradient from site 8. Dissolved phase hydrocarbon was present in both the A and B groundwater zones and in perimeter wells downgradient of both sites. Cadmium, chromium and arsenic are present downgradient of the sites which exceeded their applicable MCLs. Several floating hydrocarbon pools are in the near vicinity of these sites and hydrocarbons may be migrating towards San Pablo Bay.
- e. Inactive waste sites 6, 6A and 6B are located southeast of the plant site, south of Interstate I-80. These sites served as groundsurface disposal sites for refinery wastes. The discharger conducted soils investigations at the sites which showed soil contamination which rapidly decreased with depth. Groundwater monitoring at the sites showed that with the exception of a maximum contaminant level of 0.79 mg/l quantified as gasoline and diesel in one well at Site 6A, no TPH has migrated to the groundwater. Benzene, toluene and xylene at concentrations of 26, 84

and 130 ug/l also were identified at low levels in this sample. No volatile or semivolatile organics were detected in groundwater. No other groundwater sample showed migration of wastes to the groundwater.

- f. Site 7 was used for the disposal of oily tank bottom sludges and is located along Tormey Hill Ridge partially within the Tormey Hill groundwater basin just southeast of the seasonal product storage tanks on the southeast part of the site. Two monitoring wells at the site (MW-7-18 and MW-7-24) contained concentrations of 0.22 and .20 mg/l of TPH identified as diesel respectively. No volatile or semivolatile organics were detected in groundwater samples.
  - g. Inactive waste sites 9A and 9B are located on the southeast side of highway I-80. The sites were used for disposal of wastewater, primary treatment sludge, slop oil emulsion solids and oily tank bottom sludges. Wastes were spread on the surface and tilled into the soil. A variety of metals were present in groundwater at site 9A at concentrations below their applicable MCLs and were only slightly above their detection limits. Chromium was detected in one well at a concentration limit of 0.051 mg/l which is slightly above the MCL (0.05 mg/l). TPH was detected in one monitoring well at a concentration of 0.2 mg/l.
  - h. An area located southeast of inactive waste site 4 is utilized as a biotreated soil laydown area which has 3 monitoring wells, one upgradient and two downgradient. One downgradient well detected TPH at the detection limit of 0.1 mg/l.
14. The discharger will monitor the B zone wells along the San Pablo Bay front near the extraction trench for one year. These observations shall determine if contaminants are migrating within this zone into the Bay and if the extraction trench pumping will establish an upward gradient to prevent migration in this zone. The discharger will model results of analyses to determine if further measures will be required. The three monitoring wells MW-2B, MW-7B and MW-29B screened in the B zone did not contain hydrocarbons.

#### ANALYTIC RESULTS

15. The chief contaminants at the Unocal Refinery are various types of hydrocarbons ranging from crude oil to different types of refined products and their derivatives occurring in a wide range of concentrations. Accompanying the hydrocarbons are a variety of heavy metals, chiefly lead.

## BENEFICIAL USES OF SAN PABLO BAY

16. Beneficial uses of San Pablo Bay and San Francisco Bay are:

- a. Wildlife habitat
- b. Brackish and saltwater marshes
- c. Fish spawning
- d. Fish migration
- e. Commercial fishing
- f. Sport fishing
- g. Water contact recreation
- h. Non-water contact recreation
- i. Water fowl resting and feeding areas
- j. Preservation of rare and endangered species
- k. Estuarine habitat

The existing and potential beneficial uses of the groundwater under and in the vicinity of the Unocal Refinery are:

- a. Industrial process water supply
- b. Industrial service supply

## CALIFORNIA ENVIRONMENTAL QUALITY ACT

- 17. This action is exempt from the provisions of the California Environmental Quality Act pursuant to Section 15308, Title 14 of the California Code of Regulations.
- 18. All the waste management units listed in this Order are subject to this Order.
- 19. The Board notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for discharges from the site and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
- 20. The Board in a public hearing heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that Unocal, their agents, successors and assigns shall meet the applicable provisions contained in Title 23, Division 3, Chapter 15, of the California Code of Regulations and Division 7 of the California Water Code, and shall comply with the following:

### A. PROHIBITIONS

1. Migration of pollutants through subsurface transport to waters of the State is prohibited.
2. There shall be no discharge of wastes to surface waters except as permitted under the National Pollutant Discharge Elimination System.
3. The treatment, discharge or storage of materials which may impact the beneficial uses of ground or surface water shall not be allowed to create a condition of pollution or nuisance as defined in Sections 13050 (1) and (m), respectively, of the California Water Code.

B. SPECIFICATIONS

1. The discharger shall maintain and monitor the waste units to prevent a significant increase to exist between water quality at the point of compliance as provided in Section 2550.5, of Article 5 of Chapter 15.
2. In the event of a release of a constituent of concern beyond the Point of Compliance, the site will begin a Compliance Period pursuant to Section 2550.6(a). During the Compliance Period, the discharger shall perform an Evaluation Monitoring Program and a Corrective action program.
3. The discharger shall install any reasonable additional groundwater devices required to fulfill the terms of any Discharge Monitoring Program required by the Executive Officer.
4. This Board considers the property owner and site operator to have continuing responsibility for correcting any problems which arise in the future as a result of waste discharge or related operations or site use.
5. The discharger shall maintain any devices or design features, including the peripheral groundwater extraction trench, installed in accordance with this Order such that they continue to operate as intended without interruption.
6. The discharger shall conduct monitoring activities as specified in this Order. Should monitoring results show evidence of plume migration, additional plume characterization of pollutant extent may be required.
7. All reports pursuant to this Order shall be prepared under the supervision of a registered civil engineer, a California registered geologist or certified engineering geologist.



8.. The discharger shall comply with all applicable provisions of Chapter 15.

C. PROVISIONS

Unless otherwise noted, any reference to Sections and Articles refer to Title 23, Division 3, Chapter 15 of the California Code of Regulations.

1. The discharger shall comply with Prohibitions A.1. through A.3. immediately upon adoption of this Order.
2. All report submittals must be acceptable to the Executive Officer.
  - a. Submit a technical letter report certifying completion of all groundwater pump installations in the extraction trench sumps, piping for disposal of extracted water and compressed air piping for operation of the extraction sump pumps as needed to assure proper operation of the groundwater peripheral extraction trench.

REPORT DUE: NOVEMBER 30, 1995

- b. Submit a technical report documenting installation of all monitoring wells and/or piezometers downgradient of the extraction trench to monitor water quality in the water table. The monitoring wells and piezometers should be designed to furnish information on drawdown of the piezometric surface and permit groundwater sampling to determine the effectiveness of the extraction trench. The monitoring wells and/or piezometers must be installed no later than December 30, 1995.

REPORT DUE : January 31, 1996

- c. The discharger shall collect groundwater samples quarterly for analyses from wells completed in the A zone downgradient of the extraction trench and measure the potentiometric surface of the A zone. The wells shall monitor the effectiveness of the extraction trench.

REPORT DUE: JULY 30, 1996

- d. Submit a technical report containing results of groundwater monitoring and modeling of the B zone to evaluate the need and, if necessary, an approach for controlling groundwater quality in the B-Zone sand between the PG&E channel and the Effluent Safety basin discharge channel. The report shall evaluate the effect, if

any, on removing the contaminants from the B zone sand. The report must be accompanied by a map showing the locations of monitoring wells used in the study and their proximity to the extraction trench.

REPORT DUE: JULY 15, 1996

- e. Submit a technical report containing the results of sampling and analyses of the extraction trench discharge quarterly and measure or estimate the amount of fluid withdrawn.
- f. The discharger shall file with the Board quarterly self monitoring reports acceptable to the Executive Officer, which must include detailed analyses of groundwater contaminants presented in tabular form. The reports shall contain piezometric surface maps and well location maps and must include a summary report of results of analyses. The reports must be in conformity with the provisions set forth in Article 5 of Chapter 15.

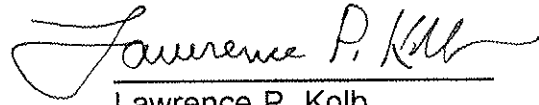
REPORT DUE: 60 DAYS AFTER THE END OF THE QUARTER

- g. Monitoring of groundwater wells must include the Land Treatment Area as specified under monitoring requirements of the Post Closure Permit pursuant to 40 CFR 264. Each inactive waste management unit, the refinery perimeter and the biotreated soil laydown area must be monitored with the exception of WMUs 1, 2 and 3 which were cleaned closed under the direction of the Department of Health Services (DHS). The Primary and Main Storm Basins remain dry during the majority of the year and must be monitored when stormwater runoff is stored in these basins.
- h. Groundwater quality monitoring requirements for WMUs 4, 5, 6, 6A, 6B, 7, 8, 9A and 9B are specified in Section 2550.7 Article 5 of Chapter 15. The monitoring of groundwater must include a sufficient number of wells to detect a release to the uppermost aquifer. Pursuant to Section 2550.1 of Article 5, Chapter 15, either a detection, evaluation or corrective action monitoring program is required for each WMU.
- i. Wells containing floating hydrocarbons shall not be sampled for groundwater analyses. A map showing the location of these wells can be combined with the well location map which must accompany the quarterly reports.

3. The discharger shall sample and analyze groundwater and surface water samples for the chemical parameters presented in Table 1 of Attachment B of the Discharge Monitoring Program.
4. In the event of any change in control or ownership of the facility presently owned or controlled by the discharger, the discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation of this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of this Order. The request must contain the requesting entity's full legal name, the address and telephone number of the persons responsible for contact with the Board. A statement must be furnished that the new owner/operator shall comply with the signatory paragraph described in the Standard Provisions and state that the new owner or operator assumes full responsibility for compliance with this Order.
5. The discharger shall maintain a copy of this Order at the site so as to be available at all times to site operating personnel.
  - a. The discharger shall permit the Board or its authorized representative immediate entry onto the premises upon presentation of credentials:
  - b. Access to copy any records required to be kept under the terms and conditions of this Order.
  - c. Inspection of any monitoring equipment or monitoring method required by this Order or by any other California State Agency.
  - d. Sampling of any discharge or groundwater governed by this Order.
6. Order No. 89-180 adopted December 13, 1989 is herewith rescinded.
7. These requirements do not authorize commission of any act causing injury to the property of another or of the public; do not convey any property rights; do not remove liability under federal, state or local laws.

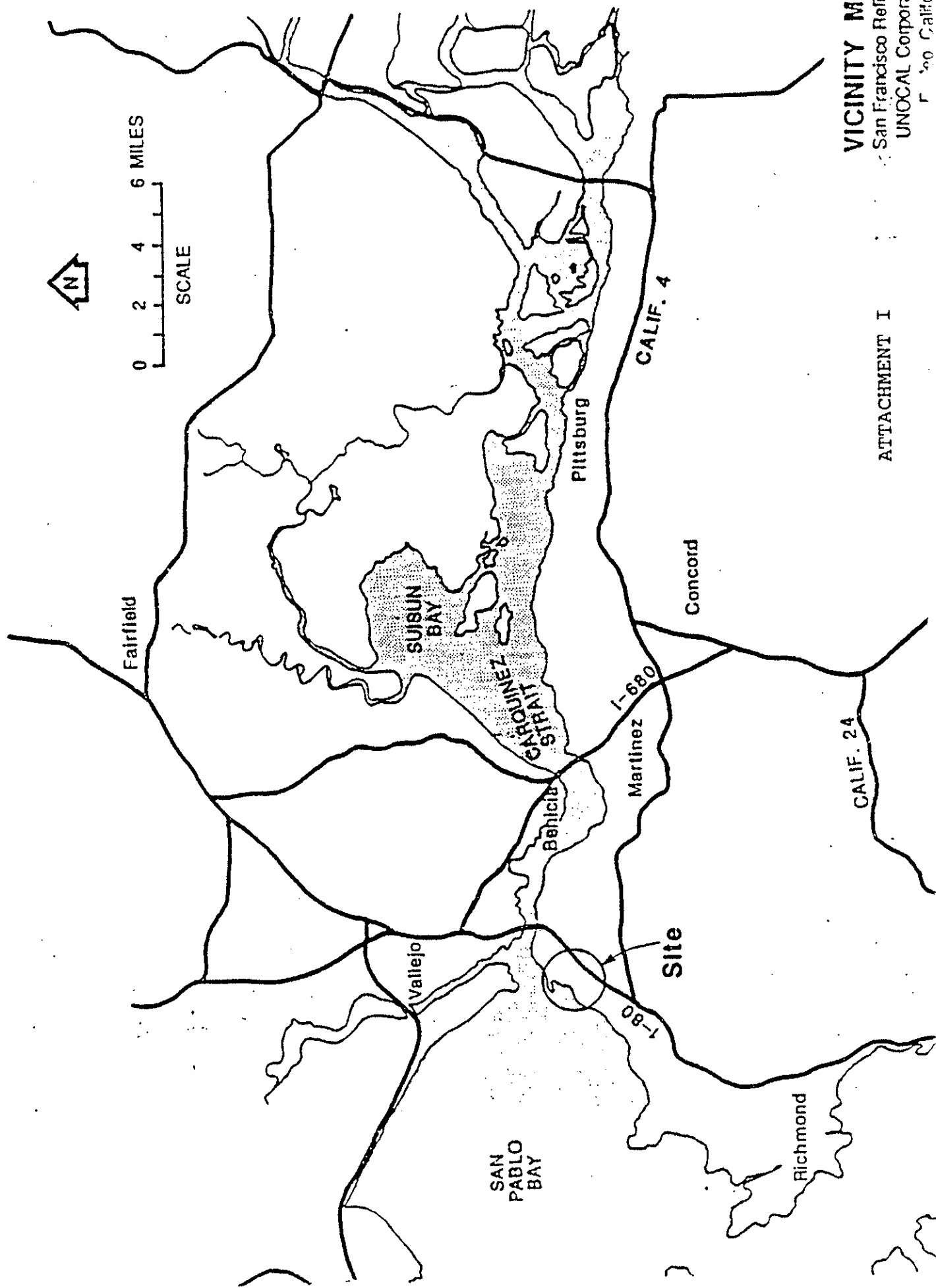
8. This Order is subject to Board review and updating, as necessary, to comply with changing State or Federal laws, regulations or policies, or guidelines; changes in the Boards Basin Plan; or changes in discharge characteristics.

I, Lawrence P. Kolb, Acting Executive Officer, do hereby certify that the foregoing is a full, complete, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on October 18, 1995.

  
Lawrence P. Kolb  
Acting Executive Officer

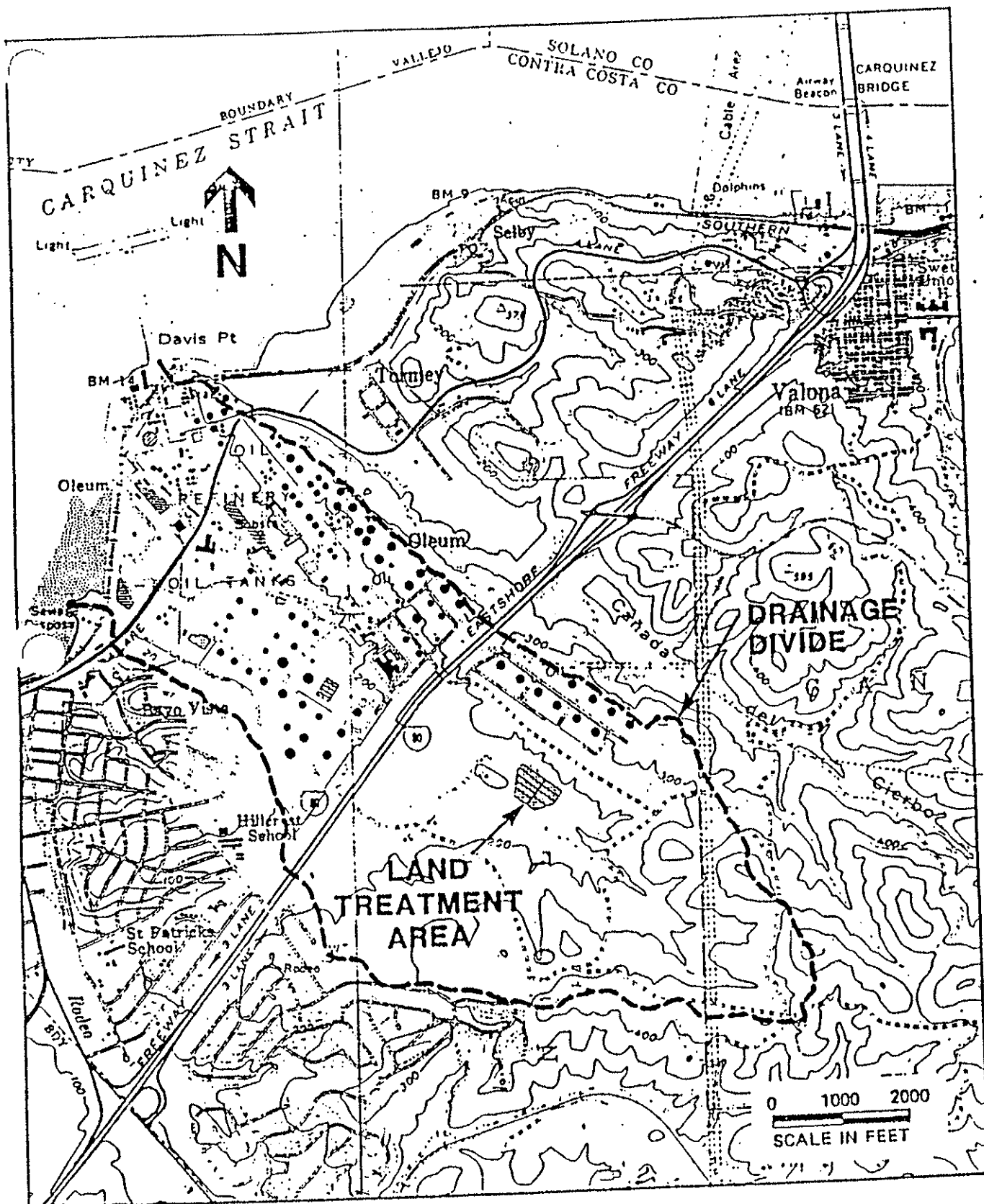
Attachments:

1. Site Location Map
2. Site Map Showing Groundwater Divide
3. Site Map Showing Location of Inactive Waste Management Units
4. Discharge Monitoring Program

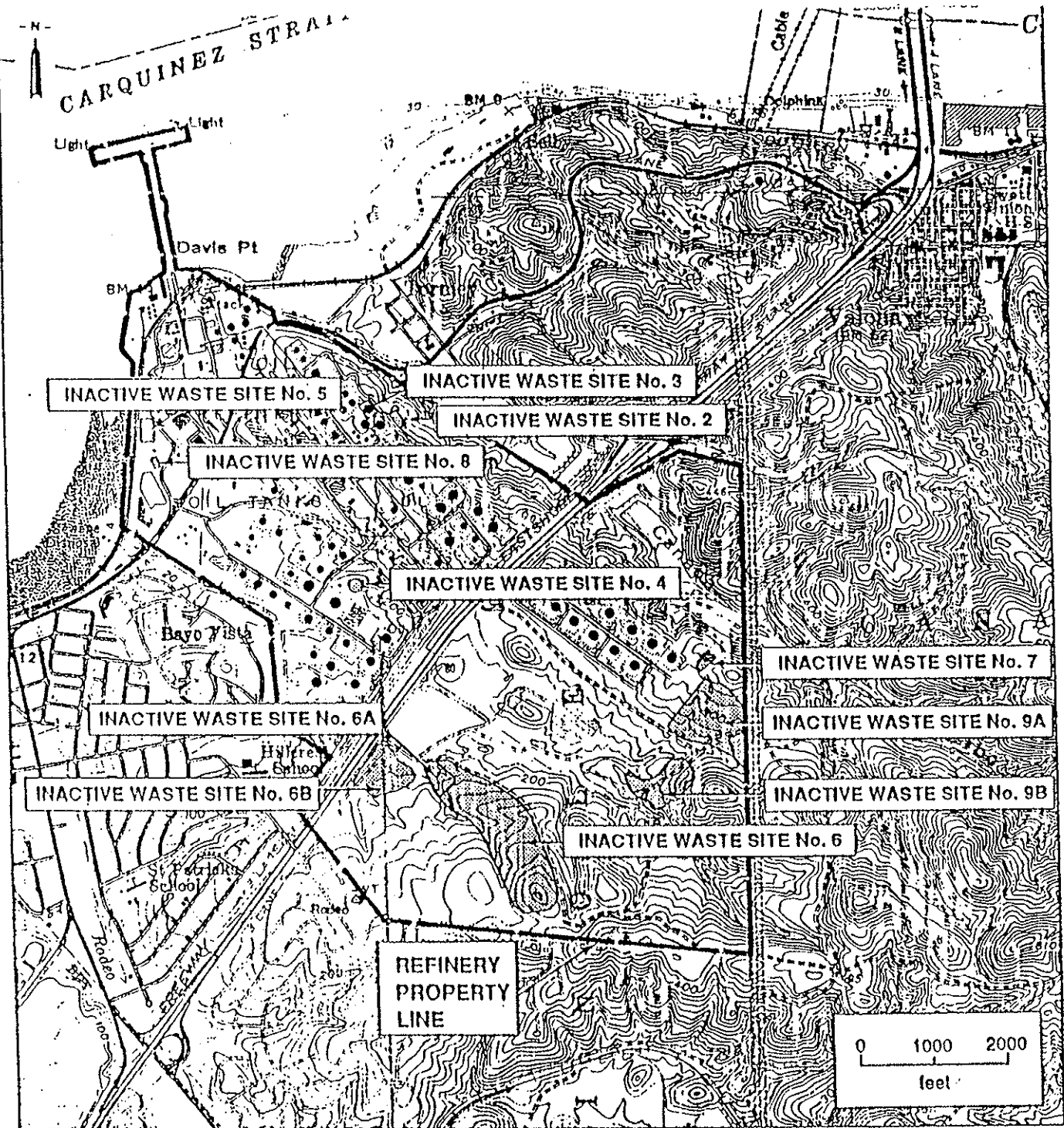


**VICINITY MAP**  
San Francisco Refinery  
UNOCAL Corporation  
Pittsburg, California

ATTACHMENT I



Location Map



MONTGOMERY WATSON

FIG. 3

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD**

**SAN FRANCISCO BAY REGION**

**DISCHARGE MONITORING PROGRAM**

**FOR**

**UNOCAL CORPORATION**

**SAN FRANCISCO REFINERY**

**RODEO, CONTRA COSTA COUNTY**

**ORDER NO. 95-209**

**CONSISTS OF**

**PART A**

**AND**

**PART B**



## PART A

### A. GENERAL

Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13383, and 13387(b) of the California Water Code and this Regional Board's Resolution No.73-16. This Self-Monitoring Program is issued in accordance with Section C.2.f. of Regional Board Order No. 95-209..

The principal purposes of a self-monitoring program by a waste discharger are:

- (1) to document compliance with waste discharge requirements and prohibitions established by the Board,
- (2) to facilitate self-policing by the waste discharger in the prevention and abatement of pollution arising from waste discharge,
- (3) to develop or assist in the development of effluent standards of performance, pretreatment and toxicity standards, and other standards, and (4) to prepare water and wastewater quality inventories,
- (4) to assist the discharger in complying with the requirements of Article 5, Chapter 15 as revised July 1, 1991.

### B. SAMPLING AND ANALYTICAL METHODS

#### Sampling

Sample collection, storage, and analyses shall be performed according to most recent version of EPA Standard Methods for the Analysis of Wastewater and in accordance with an approved sampling and analysis plan.

Water and wastewater analysis shall be performed by a laboratory approved for these analyses by the State of California. The director of the laboratory whose name appears on the certification shall supervise all analytic work in his/her laboratory and he/she or their authorized representative shall sign all reports of such work submitted to the Regional Board.

All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements.

## C. DEFINITION OF TERMS

1. A grab sample is a discrete sample collected at any time.
2. A composite sample is a sample composed of individual grab samples mixed in proportions varying not more than plus or minus five percent from the instantaneous rate of waste flow corresponding to each grab sample collected at regular intervals not greater than one hour, or collected by the use of continuous automatic sampling devices capable of attaining the proportional accuracy stipulated above throughout the period of discharge or 24 consecutive hours, whichever is shorter.
3. Receiving waters refers to any water which actually or potentially receives surface or groundwater which pass into, through, or under the waste management units or contaminated soils. The receiving waters are the groundwater beneath and adjacent to the waste management units, the surface runoff from the site, and the drainage ditches surrounding the site. San Francisco Bay or it's subbasins or nearby streams into which water from the unit discharges are considered receiving waters.
4. Standard observations refer to:
  - a. Receiving Waters
    - 1) Floating and suspended materials of waste origin: presence or absence, source, and distance of travel.
    - 2) Discoloration and turbidity: description of color, source, and nature of material.
    - 3) Evidence of algal or other unusual growth presence or absence.
    - 4) Evidence of odors, presence or absence, characterization, source, and distance of travel from source.
    - 5) Evidence of beneficial use: presence of water associated wildlife.
    - 6) Flow rate
    - 7) Weather conditions: wind direction and estimated velocity, total precipitation during previous five days and day of observations.
  - b. Perimeter of the waste management unit.

- 1) Evidence of liquid leaving or entering the waste management unit, estimated size of affected area. (Show affected area on map)
- 2) Evidence of algal or other unusual growth, presence or absence, characterization, mineral or salt deposition.
- 3) Evidence of erosion and/or daylighted refuse.

c. The waste management unit.

- 1) Evidence of algal or other unusual growth. Precipitation of sludge or minerals, quantity, nature and chemical composition.
- 2) Evidence of erosion and/or daylighted refuse.
- 3) Evidence of odors, presence or absence, characterization, source and distance of travel from source.

D. SCHEDULE OF SAMPLING, ANALYSIS, AND OBSERVATIONS

The discharger is required to perform sampling, analysis, and observations according to the schedule specified in Part B, and the sampling and analysis plan, in the following media:

1. Groundwater per Section 2550.7(b)
2. Surface water per Section 2550.7(c) and per the general requirements specified in Section 2550.7(e) of Article 5, Chapter 15 and
3. Vadose zone per Section 2550.7(d), wherever feasible.

E. RECORDS TO BE MAINTAINED

Written detection monitoring reports shall be maintained by the discharger or laboratory and shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Board. Such records shall show the following for each sample:

1. Identity of sample and sample station number.
2. Date and time of sampling.
3. Date and time that analyses are started and completed, and name of the personnel performing the analyses.

4. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used. A reference to a specific section of standard EPA methods.
5. Calculation of results.
6. Results of analyses, and detection limits for each analyses.

F. REPORTS TO BE FILED WITH THE BOARD

1. Written detection monitoring reports shall be filed by the discharger within 60 days following the end of each calendar quarter. In addition, an annual report shall be filed as indicated in Item H. below. The reports shall be comprised of the following:

a. Letter of Transmittal

A letter transmitting the essential points contained in each self-monitoring report should accompany each report. Such a letter shall include a discussion of any required information, violations found during the last reporting period, and actions taken or planned for correcting the violations, such as, operation and/or facilities modifications. If the discharger has previously submitted a detailed time schedule for correcting violations, a reference to the correspondence transmitting such information will be satisfactory. If no violations have occurred in the last report period this shall be stated in the letter of transmittal. Monitoring reports and the letter transmitting the monitoring reports shall be signed by a principal executive officer at the level of vice president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct.

- .b The annual monitoring report shall include a compliance evaluation summary sheet which shall contain:
  - 1) The sample mean and the sample variance for all sample sets taken from all compliance points, and shall determine if the difference between the mean of each sample set and the water quality protection standard is significant at the 0.05 level as described in Section 5 of Chapter 15. The discharger may propose a statistical procedure to be used in making this determination pursuant to Article 5, Section 2550.7, Subsection (e)(7), (e)(8), and (e)(9) of Chapter 15. If a statistically significant difference is found this shall be reported as a suspected release requiring the discharger to enter into a

verification monitoring program.

- 2) A graphic description and map of the direction and elevation of groundwater flow and the piezometric surface under/around the waste management unit, based upon the past and present water level elevations and pertinent visual observations.
  - 3) The method and time of water level measurement, the type of pump used for purging, pump placement in the well; method of purging, pumping rate, equipment and methods used to monitor field pH, temperature, and conductivity during purging, calibration of the field equipment, results of the pH, temperature, conductivity and turbidity testing, well recovery time, and method of disposing of the purge water.
  - 4) Type of pump used, pump placement for sampling, a detailed description of the sampling procedure; number and description of equipment, field and travel blanks; number and description of duplicate samples; type of sample containers and preservatives used, the date and time of sampling, the name and qualifications of the person actually taking the samples, and any other observations. The chain of custody record.
- c. A map or aerial photograph shall accompany each report showing observation and monitoring station locations.
- d. Laboratory statements of results of analyses specified in Part B must be included in each report. The director of the laboratory whose name appears on the laboratory certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Board.
- 1) The methods of analyses and detection limits must be appropriate for the expected concentrations. Specific methods of analyses must be identified. If methods other than EPA approved methods or Standard Methods, are used the exact methodology must be submitted for review.
  - 2) In addition to the results of the analyses, laboratory quality control/quality assurance (QA/QC) information must be included in the monitoring report. The laboratory QA/QC information should include the method, equipment and analytical detection limits; the recovery rates; an explanation for any recovery rate that is less than 80%; the results of equipment and method blanks; the results of spiked and surrogate samples; the frequency of quality control analysis; and the name and qualifications of the person(s) performing the analyses.

## G CONTINGENCY REPORTING

- a.. A report shall be made by telephone of any seepage or overflow from the waste management unit immediately after it is discovered. A written report shall be filed with the Board within five days. This report shall contain the following information:
  - 1) a map showing the location(s) of any seepage or dike rupture.
  - 2) approximate rate of overflow.
  - 3) nature of effects; i.e. all pertinent observations and analyses; and
  - 4) corrective measures underway or proposed.
- b. A report shall be made in writing to the Board within seven days if a statistically significant difference is found between a self-monitoring sample set and a WQPS. Notification shall indicate what WQPS(s) have been exceeded. The discharger shall immediately resample at the compliance point(s) where this difference has been found and analyze another sample set of at least four portions split in the laboratory from the source sample.
- c. If resampling and analysis confirms the earlier finding of a statistically significant difference between self-monitoring results and WQPS(s) the discharger must submit to the Board within 90 days an amended Report of Waste Discharge for establishment of a verification monitoring program meeting the requirements of Section 2557 of Article 5 of Chapter 15. This submittal shall include the information required in Section 2556(b)(2) of Chapter 15.
- d. The discharger must notify the Board within seven days if the verification monitoring program finds a statistically significant difference between samples from the verification monitoring program point of compliance and the WQPS(s).
- e. If such a difference or differences are found by the verification monitoring program, it will be concluded that the discharger is out of compliance with this Order. In this event the discharger shall submit within 180 days an amended Report of Waste Discharge requesting authorization to establish a corrective action program meeting the requirements of Section 2550.10, of Article 5 of Chapter 15. This submittal shall include the information required in Section 2550.12(g)(3) of Chapter 15.

## H. REPORTING

- 3. By April 30 of each year the discharger shall submit an annual report to the

Board covering the previous calendar year. This report shall contain:

- a. Tabular and graphical summaries of the monitoring data obtained during the previous year.
- b. A comprehensive discussion of the compliance record, and the corrective actions taken or planned which may be needed to bring the discharger into full compliance with the waste discharge requirements.
- c. A map showing the waste management units, monitoring well locations, ground and casing point measuring elevations and data on elevations at pond sampling and freeboard measuring locations.
- d. A written summary of the groundwater analyses indicating any change in the quality of the groundwater.
- e. Pondered water analytic data.

#### I. WELL LOGS

An evaluation of the effectiveness of the extraction systems, which includes an evaluation of a summary of volumes of extracted waters removed from the units and a discussion of the groundwater disposal methods utilized.

4. A boring log shall be submitted for each sampling well established for this monitoring program, as well as a report of inspection or certification that each well has been constructed in accordance with the construction standards of the Department of Water Resources. These shall be submitted within 30 days after well installation.
  - a. For all monitoring wells established for this program continuous core samples must be taken in all borings, unless multiple wells are to be constructed in the immediate vicinity, in which case only the deeper boring would need to be continuously sampled. Each boring log must include the name, registration number and signature of the supervising geologist, the name of the person actually logging the hole, the name of the drilling company, type of drilling method used, grain size distribution analysis, soil moisture content, blow count, sample recovery rate, initial and stabilized water levels, in-place permeability, and ground surface elevation. Soil and clay samples should be retained for chemical analyses to determine if pollution or adsorption has occurred from pond seepage.
  - b. For all monitoring wells established for this program the rationale for the selected slot size and sand pack; and the method used to place the sand pack,

seal, and grout must be reported. The well annulus must be sealed with bentonite concrete and a surface concrete seal must be placed at the top of the well. All wells must be surveyed to a clearly marked common reference point.

- c. For all monitoring wells established for this program transmissivity, hydraulic conductivity and gradient must be estimated.



## PART B

### DESCRIPTION OF OBSERVATION STATIONS AND SCHEDULE OF OBSERVATIONS

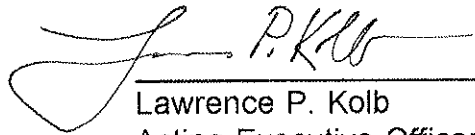
#### a. GROUNDWATER MONITORING - Report Quarterly

1. The discharger shall collect groundwater samples at the compliance points. The discharger shall prepare a map showing all compliance points, which data shall be combined with the piezometric surface map. The discharger shall designate on the map all wells having floating hydrocarbons.
2. Ground water samples shall be collected at the following compliance points.  
  
The Seasonal Products Storage Tank Area. Groundwater  
The Upper Tank Farm. Groundwater  
The Lower Tank Farm. Groundwater  
Soils Biotreatment Area. Groundwater  
Primary and Main Storm Basin. Groundwater  
The Perimeter Wells. Groundwater  
Effluent Safety Basin. Groundwater  
All closed and inactive Waste Management Units. Groundwater
3. The discharger shall sample the discharge from the extraction trench quarterly and report the analytical results within 60 days..
4. Groundwater from monitoring wells having floating hydrocarbons shall not be sampled or analyzed. Sampling periods must include the months of February 1, to March 31 and quarterly thereafter.
5. The Discharger shall perform pH field measurements of all collected water samples.
7. The discharger is required to collect samples for all monitoring points at 3 month intervals and submit reports of analyses within 60 days upon completion of the quarter as specified in the Provisions of Order No. 95-209.
8. The discharger shall submit an annual summary report to the Board covering the previous 4 quarters of monitoring. The report is to be combined with the 4th quarter monitoring report.

9. The discharger shall inspect all facilities once per quarter to insure proper and safe operation and report any incidents not in compliance with this Order.

I, Lawrence P. Kolb, Acting Executive Officer hereby certify that the foregoing self Monitoring Program:

1. Has been developed in accordance with the procedures set forth in this Board's resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in this Board's Order No. 95-209.
2. Is effective on the date shown below;
3. May be reviewed or modified at any time subsequent to the effective date, upon written notice from the Executive Officer.

  
Lawrence P. Kolb  
Acting Executive Officer

Date Ordered: 10/23/95

Attachment:  
List of Analytic Parameters

GROUND WATER MONITORING PROGRAM										
Well No.	As,Ba,Cr	As,Ba,Cd,Cr	Pb	Hg	Cr,	AVOC	VOC	SVOC	Com. Zone	TPH-E
MW-6-35			X	X		X		X	A	X
MW-6B-1			X	X		x		X	A	X
MW-6B-2			X	X		X		X	A	X
MW-6B-3			X	X		X		X	A	X
MW-6A-1			X	X		X		X	A	X
MW-6-36			X	X		X		X		X
MW-9A-1	X		X	X		X		X	A	X
MW-9A-3			X	X	X	X		X	A	X
MW-9A-4			X	X	X	X		X	A	X
MW-9B-1			X	X	X	X		X	A	X
MW-9B-2			X	X	X	X		X	A	X
MW-7-26	X		X					X		
MW-7-27	X		X					X		
MW-7-28	X		X					X		
MW-120			X			X		X	A	X
MW-121			X			X		X	A	X
MW-123			X			X		X	A	X

GROUND WATER MONITORING PROGRAM											
MW-124				X				X		X	
Well No.	As,Ba,Cr	As,Ba,Cd,Cr	Pb	Hg	Cr,	AVOC	VOC	SVOC	Com. Zone	TPH-E	
MW-125			X			X		X	A	X	
MW-126			X			X		X	A	X	
MW-127			X			X		X	A	X	
MW-183			X			X		X	A	X	
MW-175			X			X		X	A	X	
MW-176			X			X		X	A	X	
MW-129			X			X		X	A	X	
MW-144			X			X		X	A	X	
MW-4-8			X			X		X	A	X	
MW-4-9			X			X		X	A	X	
MW-4-10			X			X			A	X	
MW-140A1			X			X		X	A	X	
MW-141			X			X		X	A	X	
MW-142A									A	X	
MW-146			X			X			A	x	
MW-148			X			X			A	X	
MW-177			X			X			B	X	

GROUND WATER MONITORING PROGRAM												
MW-172				X				X			A	X
MW-150				X				X			A	X
MW-178				X				X			A	X
Well No.	As,Ba,Cr	As,Ba,Cd,Cr	Pb	Hg	Cr,	AVOC	VOC	SVOC	Com. Zone	TPH-E		
MW-179			X			X			B	X		
MW-181			X			X			A	X		
MW-180			X			X			B	X		
EEI-13			X			X			A	X		
MW-155			X			X			A	X		
EEI-11			X			X			A	X		
MW-103	X		X			X		X	A	X		
MW-104	X		X			X		X	A	X		
EEI-21	X					X		X	A	X		
MW-27	X					X		X	A	X		
MW-26A	X					X		X	A	X		
MW-24	X					X		X	A	X		
MW-16	X					X		X	A	X		
MW-9	X					X		X	A	X		
MW-165	X		X	X			X	X	A			
MW-166	X		X	X			X	X	B			

GROUND WATER MONITORING PROGRAM											
MW-158	X			X	X				X	X	A
MW-159	X			X	X				X		B
MW-160	X			X	X				X		A
MW-161	X			X	X				X		B
Well No.	As,Ba,Cr	As,Ba,Cd,Cr	Pb	Hg	Cr,	AVOC	VOC	SVOC	Com. Zone	TPH-E	
EEI-10		X	X						X		A
MW-157		X	X						X		B
EEI-8		X	X						X		A
MW-2B		X	X						X		B
EEI-4		X	X						X		A
MW-17B		X	X								
MW-173			X			X			X		A
MW-174			X			X			X		A

Explanation:

Metals	Common Name	EPA Analytic Method
As	-Arsenic	7060
Ba	-Barium	6010
Cr	-Chromium	6010
Cd	-Cadmium	7131
Pb	-Lead	7421
Hg	-Mercury	7470
Note: Metal samples to be field filtered & analyzed for dissolved metal concentrations		
Organics		
AVOC	Aromatic Volatile Organic Compounds	8020
VOC	Volatile Organic Compounds	8240
SVOC	Semi-volatile Organic Compounds	8270
TPH-E	Extractable Petroleum Hydrocarbons	3510/M8015
Com Zone	Completion Zone	
TPH-E	concentrations exceeding 2 mg/L or greater will be analyzed for SVOCs by EPA method 8270	